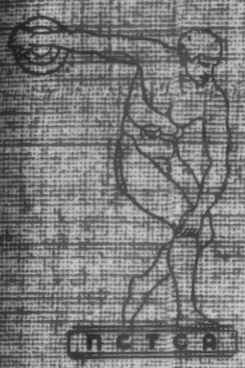


Clinic Notes

24th Annual Meeting

of

National Collegiate Track Coaches Association

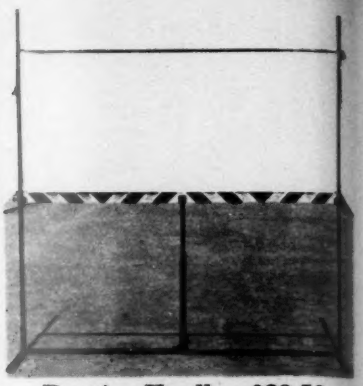
at

University of Nebraska

June, 1953

Six Hurdle Models
$7.85 and Up

Discus Marker
$1.25



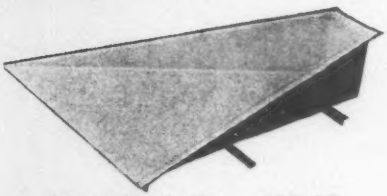
Practice Hurdle $29.50

Track and Field Equipment Supply

Slippery Rock, Penn.
Palo Alto, Calif.

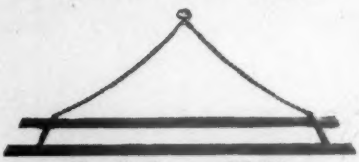
Metal Javelin Toe Board $19.75

Aluminum
Baton
$ .95



Metal Vault Box $19.95

Hurdle Cart $48.80



Track Drag 35.00

Starting Block $7.50

Meet Record Cards $ .90

Shot Return Trough $32.00

Sliding Standards $59.90

Multiple DRY eight lane adjustable track liner. $99.50

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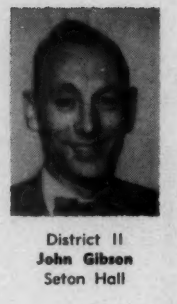

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THE NATIONAL COLLEGIATE TRACK COACHES ASSOCIATION

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JUNE MEETING, University of Nebraska, Lincoln, Nebraska

Presiding Officer, George L. Rider, Miami University, Oxford, Ohio, President, National Collegiate Track Coaches Association, 1953

M. E. "Bll" Easton ..... Editor

Minutes of the Spring Meeting
National Collegiate Track Coaches Association
University of Nebraska, Lincoln, Nebraska

The National Collegiate Track Coaches Clinic of 1953, was a top performance as far as the coaches were concerned. The facilities and hospitality of the University of Nebraska were wonderful and the attendance was one of the very best. The clinic was, without question, one of the finest that we have held, and we are in hopes that 1954 will give us an equally fine group of men to talk to the track coaches of the United States. Wednesday night, June 17, the track coaches buffet dinner was held at the Cornhusker Hotel. It was well attended and at 8:00 a resume of the 1952 Olympic Games was given by Head Olympic coach, Brutus Hamilton, followed by recommendations to the college coaches for the 1956 games. Mr. Hamilton lauded the fine performance of the United States' Olympic team for their performance at Helsinki and went on to point out many of the problems that will face us prior to the 1956 games to be held in Australia. It was a very inspiring talk and one that I wish more of our track coaches could have heard, as well as our faculty and business men of the United States.

At 9:00 the 1952 NCAA Track and Field film was shown, as well as the 1952 Olympic picture, courtesy of the Helms Foundation in Los Angeles. Both of these are very fine pictures and I feel sure your men would enjoy them if you have not had the pleasure of showing them before.

Following the pictures, President George Rider, Miami University, called an executive meeting that lasted until 10:30.

The annual June coaches clinic was held at the Cornhusker Hotel, starting Thursday morning at 9:00, June 18, 1953. The meeting was called to order by the President, George Rider, Miami University, and a word of welcome was extended to all coaches present. There was a very fine turnout indicating the interest in the NCTCA clinic. 9:00 to 10:30, Coach Ward Haylett, Kansas State College, gave a very interesting discussion on the Broad Jump. He brought out many points that will improve our broad jumpers. 10:30 to 11:45, Dr. Sid Robinson, from the University of Indiana Physiology Department, gave a very learned discussion on "Applications of Physiology in Athletics." In the question and answer session following his paper, many interesting points were brought out and elaborated on by Dr. Robinson. We feel it was one of the finest papers ever given before the track coaches clinic and we can do well to repeat a performance by men from various physiology departments throughout the United States. 1:30 to 2:30, Col. Frank Anderson, Track Coach, Texas A & M College, ably assisted by Darrow Hooper, A & M's great shot putter and Parry O'Brien of USC, gave a very fine discussion on the shot put. It was one of the very best that we have ever heard and brought out many of the points in question that revealed the many radical changes that have taken place in the shot during the last few years. Friday morning, June 19, Coach Jess Mortensen, University of Southern California, gave a paper on the High Hurdles and was assisted by Jack Davis, his great hurdler who discussed his workout program and answered questions by the coaches.

Business Meeting, NCTCA, Friday morning, 10:30 a.m. President George Rider (Miami) presiding. Secretary's report on the new NCTCA constitution was given, in which he stated there were no dissenting votes concerning the body of the constitution. It was taken by consent this would be the new constitution of the NCTCA.

President George Rider called for a financial report by the Secretary-Treasurer and this was given and turned over to the auditing committee.

The question of raising money for NCTCA was discussed at length with many ideas brought forth by the various members. It finally boiled down to the fact that we need more membership in our organization to give us more working capital. Two or three suggestions might be followed. One, take up the membership question in your track classes that you teach in your University and tell them the possibilities of the organization. Secondly, get all of the official staff of our University to join our organization and get their $5.00 dues. Sell to each of the high school coaches throughout the state membership in our NCTCA. This is an excellent suggestion to not only bring in memberships to our organization but to improve the knowledge and technique in each of your high school coaches.

We are definitely in need of greater membership on the college level, as there are many collegiate coaches still not members of NCTCA, who definitely should be a part of our organization.

The question of a mid winter meeting to be held at the time of the National Collegiate convention meetings in Cincinnati, was discussed. It was pointed out the January meeting would be in a central location in Cincinnati and should be an excellent opportunity for the track coaches of the Midwest to meet and and discuss many of their problems. It was also pointed out that many of the coaches would like to attend the mid-winter anyhow, as they would like to attend the discussion on other sports. Coach Chick Werner particularly emphasized the standardization committee would like to hold a winter meeting to discuss the problems being presented to their group. He remarked that progress in rules standardization is being made by this committee and it is far from being dead. His committee hopes to have a report ready for the track coaches clinic next June. This committee has worked hard and is making slow but forward progress. Motion was made by Carl Olsen, Pittsburgh, to hold a winter clinic meeting in Cincinnati in January at the time of the NCAA convention. Voted 19 to 8 for meeting in January. It was suggested that anyone interested in attending the meeting should spread the news to the people of his countryside and tell them a track clinic would be held. The secretary to notify Walter Byers, Kansas City NCAA office, and have it placed in the outline for the NCAA convention.

President Rider commended the fine job done on the All-American certificates, given to each of the athletes chosen by the National Rules Committee of the track coaches and suggested that he would like to see the NCTCA present a duplicate copy to each school. This would be an additional expense and at the present time the secretary-treasurer does not feel the expense can be

borne by the organization. Any institution that would like to have a duplicate All-American certificate may do so by sending a check for $4.00, made payable to NCTCA Bill Easton, University of Kansas, Lawrence, Kansas, and he will see that your copy is mailed in due time.

President Rider recommended that honorary membership certificates, signifying the same, be given to coaches who had retired on the job. These are to be made and sent to the men who had been active in this association and who had retired on the job and/or who had been Head Olympic Coaches. The following names were suggested and if you have others please see that the secretary gets them at once: A. A. Stagg, Andy Gill, Ned Merriam, Dean Cromwell, Frank Hill, Carl Merner, Tom Jones, Harry Hughes Moakley. Passed unanimously. Coach Larry Snider, Ohio State, made a motion that Mr. Phil Diamond, Ann Arbor, Michigan, be made recording secretary for NCAA meets; to record the minutes of the NCAA track coaches meetings, as well as all new rulings and the results of all NCAA track drawings. This met with unanimous approval of all and was passed accordingly. Coach Karl Schlademan suggested that we recommend to the rules committee of the NCAA that preliminaries and semi-finals be run in all NCAA meets in the 100, 220, 440 and both hurdle events. A committee of two was appointed made up of Karl Schlademan, Michigan State, and Heck Edmundson, Washington, to work up this recommendation and present it to the rules committee.

Coach Riley Best, Wisconsin, asked "What action can be taken on scratches at time of NCAA meeting, so that we will know the definite entries in each of the events?" The following motion by Riley Best, seconded by Rut Walters, Northwestern, was made with the recommendation that it be presented to the rules committee to be published in the rules book. "Coaches or representatives of teams or individuals entered in NCAA meet, should be present at drawings to represent their schools, or they call or wire in definite entries at the time of the NCAA drawings. Otherwise, entries not accounted for will be scratched from the event. Passed unanimously. It was moved by Chick Werner, Penn State, any athlete who is entered in an event in which preliminaries are run, must participate in this event or be scratched from the meet. This motion was voted down. The auditing committee, Anderson, Botts, Shimik, recommended that the secretary-treasurer's report be accepted as given. President Rider brought out the question of dividing the secretary and treasurer's job. It was pointed out this would necessarily call for a change in the constitution. Karl Schlademan, Michigan State, moved, "Secretary-Treasurer job may or may not be combined under the NCAA constitution." Carried unanimously.

The President called for the report of the nominating committee for next year's officers. The following names were submitted by the committee. President, Al Moreau, Louisiana State University at Baton Rouge, La.; Vice President, Kenneth Doherty, University of Pennsylvania, Philadelphia, Pa.; Treasurer, Riley Best, University of Wisconsin, Madison, Wis.; Secretary, M. E. Easton, University of Kansas, Lawrence, Kansas. There were three changes in the advisory committee, as announced by the nominating committee. John Jacobs, University of Oklahoma, Norman, Okla., was elected to the office of NCAA District 5, Harry Adams, Montana State ,University Missoula, Mont., to District 7, and Payton Jordan, Occidental College, Los Angeles, Calif., committee member-at-large. Moved by Frank Potts, Colorado, second by Frank Anderson, Texas A & M, that we accept the report of the committee and moved that a unanimous ballot be cast for the same. Passed unanimously. Meeting closed at 12:00 noon.

The Broad Jump

By WARD HAYLETT

Track Coach, Kansas State College

Broad jumping is both an art and a science. Like art it is natural to a great degree and like science it is both exact and exacting. Thus, a good jumper must have natural ability and must be a careful student of his event.

Some of the things we look for and expect to find in a good broad jumper are speed, spring and coordination and while you are looking, you might as well look for a man with good feet and legs, especially a strong arch and ankle, because without the first three attributes he will not be much of a performer in the first place and without the latter he won't last long anyway.

Some squads will be fortunate enough to have men who are only broad jumpers and if so, that is fine. However, if you are not fortunate enough to have specialists, some very good jumpers have been made from mediocre high jumpers who have some speed. Also, if you have a sprinter who is fairly good but not quite tops but who has some spring he may make a good jumper with work and coaching. Some very fine jumpers are also recruited from among the hurdlers at times. Naturally, your top sprinters are always great prospects if they are rugged enough to stand the event and you are willing to gamble on injury.

Some coaches I have heard talk have discounted the need for check marks, but to me they are absolutely essential. With only three preliminary jumps in A.A.U. Meets and in International competition and only four trials in most high school and college meets we often see a man foul out of the competition entirely or at least fail to qualify for the finals because of fouling his best jumps. Much of this can be avoided by careful coaching and preparation in advance. Another big argument for the check marks is that by the use of them an athlete gains confidence and with most men nothing improves performance like confidence. I do not care what method you use but I like to have two check marks, one about 6 strides from the take-off board and the other about 6 strides in front of the first. Others use 8 strides which may be better if the run way is long enough. Run ways should allow as nearly as possible almost unlimited run. After the check marks are established the distances should be measured and a record made of them for each man so they can always be transferred to any run way the athlete uses. Even then the jumper should always get out long before his event and after he has measured off his distances they should be checked carefully by the trial and error method —some run ways are faster and some are slower than the one which is commonly used and adjustments have to be made accordingly. Also, weather conditions will enter in. All of these conditions should be noted and checked. If your jumper has not been instructed and cautioned about all these possibilities and fouls out of competition, you have no one but yourself to blame.

I also think that it is a good plan to have your jumper really ready and set for his first jump and then have him give everything he has in this first effort. If he gets a good jump he is well set and if he fouls, or for some other reason gets a poor jump, have him try to make everything sure on the second jump and at least try for a qualifying mark on this one. If he gets what under ordinary circumstances should be a qualifying mark in the field involved, then he ordinarily has two more preliminary jumps, plus the finals to try to improve his mark.

The worst thing that can happen, as far as the poise of an athlete and the peace of mind of a coach, is for the competitor, through carelessness or lack of attention to detail, to come up to his final trial and still not have a qualifying mark. Of course, the rules being what they are, not every jumper is going to qualify but if the competitor is beaten by a better jumper after he has done everything he can to the best of his ability, that is unavoidable.

Some of this is so fundamental and elemental that it seems to be a waste of time to go over it, but perhaps some beginning coach or athlete will read it and get some benefit from it.

After the jumper has done considerable training on sprinting, some easy high jumping and possibly some work over two or three low hurdles set at about 10 yard intervals, and has worked on his stride with the check marks he should be ready to do some work on the take-off. In his run to the take-off he should run with his toes straight ahead and with good knee action and have his knees in line with his feet. As the jumper approaches about three strides from the board the tail is lowered somewhat and the stride is shortened, especially the last one. In this way one gains position and relaxation for the lift from the board. The impact of the take-off foot and the board should be very vigorous with the feet, legs, arms and body in or attaining the following positions:

1. Take-off foot. Toes straight ahead.
2. Knee of the take-off leg directly over the ball of the foot.
3. The weight of the body over the ball of the take-off foot.
4. Knee of the opposite leg bent and lifted with a vigorous straight up action.
5. Both arms brought up with a hard swing.
6. As the body rises the chest is thrust upward and forward.
7. After the first movement of the legs, they should be allowed to drag and then as the jumper feels he is about to light they are snapped forward and thrust as far in front of the jumper as possible while still enabling the jumper to control himself so as not to fall back when he lands.

This, of course, is only one form of jumping but regardless of the style, I think, the fundamentals are the same in all styles until the jumper is in the air. If a jumper uses a tread or kick in the air, he simply goes into this motion after leaving the board and attaining his height. If this is natural, I don't know that I would try to change a man from it, but I have quit favoring it as I have found with a great many jumpers it simply teaches a lot of scrambling around in the air and does not always produce the desired results.

If a jumper is what I call a "floater"—that is, one who runs as fast as he can, gets as high as he can, then sticks his feet out in front of him and sails as far as he can before he comes down, he can use the same take-off I have described and put his feet out in front of him earlier and not use the drag and snap through of the legs.

There are several things about landing which should be checked. I have already cautioned against over ex-

tension and falling back. However, the opposite of this is sometimes true. If a jumper pitches or rolls forward as he lights, you can be sure he hasn't had as much height as he should have had to use the speed and momentum he has attained. Some jumpers are coached to throw themselves to the side, but this can result in injury unless the construction and upkeep of the pit and surrounding area is very good.

Some other points about lighting which may be indicative of faults in form or execution of form are:

1. If the tread or kick form of jump is used and either foot is always quite a little behind the other one, it is usually true that the jumper is not getting enough height; thus, not allowing time enough for the back leg to catch up.

2. If in the "drag" type of jump, the jumper is alighting with his feet spread far apart laterally. This also indicates lack of sufficient height.

In order to get their athletes to attain height some coaches use a cross-bar or rope for the jumper to clear. It seems to me that in general this does more harm than good. Generally the jumper will simply tuck his feet up under him to avoid the obstruction and thus ruin his form and timing.

The broad jump is an event in which great care must be taken not to overdo. After the competitive season has started, it is doubtful if a jumper should try for maximum distance except in meets. Of course, if you are fortunate enough to have so many good jumpers that trials must be held to determine team personnel, it may be necessary to have trials early in the week. If this is necessary, it should be done by Tuesday if your jumpers are to compete on Friday and/or Saturday.

In spite of not jumping for distance a jumper can do a lot of good training work. Some of the usual ones are:

1. Sprinting.
2. Easy high jumping.
3. Working on his approach run.
4. A lot of work on "pop-ups" or "lifts." This is done by running under top speed to the board, taking off and going through the motions of the jumping without trying for full distance.

These are very good to develop form and timing and do not sap the strength of the take-off leg.

Some points to caution your jumper about are:

1. Since the impact of the heel of the take-off foot is so severe, the heel should be protected by the use of a sponge rubber pad of the do-nut type.

2. Since the strain on the take-off leg is quite severe, it should be strengthened in the early season by bounding, bending and other exercises.

3. The strain on the groin and abdominal region is severe. Sit-ups, flutter kicking and bar work should be done to strengthen these areas.

4. Never jump without a thorough warm-up.

To me the broad jump is one of our finest field events and one which I like very much to coach because in so many cases the athlete can be helped so much by the intelligent application of the laws of physics and proper training.

Applications of Physiology in Athletics

By **SID ROBINSON**

Department of Physiology, Indiana University

The increasingly keen competition in track reflects great credit on the college coaches in this country. Your development of some of the greatest athletes in the world is the result in many cases of years of work and experiment with the greatest machine yet invented—the human body.

Because, in final analysis, the limiting factor in all athletic competition is the athlete himself, your president has asked me to talk about the athlete from a physiologist's point of view. On previous occasions when I have addressed groups of coaches, I have found almost their only question to be, "How can I make my boy run faster —or jump farther or higher—or play basketball better, etc?" I shall take it for granted that in this, the most select group of track coaches in the world, you already know how to get the most out of your boys. My remarks will be an attempt to further your understanding of some of the physiological processes involved as those boys engage in strenuous athletic competition.

One of the most interesting physiological considerations in track athletics is the recovery of the athlete from his race. In a meet like this, where there are many competitors, and, consequently several heats in the various races, and where even milers and half milers wish to run more than one race, recovery of the athlete between races is extremely important. Since the fatigue problem is greatest for middle distance and distance runners, I shall limit my discussion to their particular problems, with the hope that some of it may be pertinent to those of you primarily interested in other events.

In order for an athlete to run well in more than one middle distance race in the same meet it is essential that he recover rapidly between races and that he be trained to run relaxed even when he is tired. This problem will be discussed from two points of view: (a) training runners for repeat performances, and (b) immediate ways of hastening recovery.

A. Training:

There is nothing which can make a man recover for a good second race in a track meet if he doesn't have a good background of training and conditioning. Training men for repeat performances will be dealt with briefly since it is the same system which prepares men for their best single performances and, therefore, a familiar process to most coaches. We originally described the system used at Indiana and the physiological basis for it in "Energy and Fatigue in Distance Running" by Sid Robinson, Cine-Sports Library, International Sports, Inc., Indianapolis, Indiana, 1939. The Swedes now call the system "speed play." This system of developing and conditioning runners is to include (a) as a major part of their training the repeated running of short distances at rates considerably faster than is required for the race, with special attention to form and (b) adequate attention to sustained pace work on the track. In the repeat system the runs are repeated after short intervals before recovery from the preceding runs has occurred. Physiologists have found that a man will accumulate a higher lactacid oxygen debt in the repeated running of short distances than he can in a sustained run of the same total distance; thus the coach is schooling his runners in tolerating a high lactic acid concentration and yet holding good form. The pro-

portions of this repeat-type of activity and of sustained pace work to include in the training programs of runners will depend on their previous development and experience and on the stage of the track season. Virtually all pre-season training of runners should be devoted to repeat running. In the earlier days at Indiana the runners were developed out of season by repeated runs up a long moderate grade (400 yards), alternating with leisurely jogs down the same grade.

B. Immediate Aids to Recovery:

There are mainly two immediate problems to consider in recovery: (a) body temperature, and (b) metabolic recovery from the oxygen debt, which includes removal of the lactic acid accumulated in the race. It should be emphasized again that no immediate aids can be substituted for good conditioning before the meet.

1. Body Temperature:

Body temperature presents a different problem in cool or cold weather from that encountered in hot weather. In cool or cold weather the problem is to avoid cooling down too much or too rapidly after a race in order to be in the best condition for a second performance. This is done by all experienced athletes by donning sweat shirts and suitable wraps and alternating periods of walking and jogging with rest periods. In cold weather it may be advisable to seek shelter during the brief rest periods, returning outside for periods of walking and jogging.

In hot weather special effort should be made to cool down between races because the athlete may become too hot in the race and the hot environment will resist cooling during recovery (figure 1). In this case he should leave sweat clothes off, seek a shady place where there is plenty of air movement, and alternate brief walks with rest periods. If excessively hot, and rest in a shady place does not cool him down, he should take a cool shower and not dry off his skin. Leaving water on the skin will facilitate cooling by evaporation. Too much activity will keep body temperature up because the heat produced within the body increases in proportion to the rate of muscular activity.

He should avoid dehydration (loss of body water) of more than 1 or 2 pounds by frequent drinking of small amounts of water or better yet a 0.1% solution of sodium chloride in water. In dehydration the loss in body fluids includes an appreciable reduction of blood plasma. This interferes with and reduces blood flow to the muscles in work and to the skin for heat dissipation. Dehydration of a man by no more than 1 or 2% of his body weight when he is under the stresses of work and heat is enough to cause increased evidence of strain, i.e higher body temperature and increased heart rate. On the other hand a runner should be careful not to overhydrate himself before or during a track meet.

Replacement of salt lost in the sweat in hot weather is just as important for the athlete as keeping his body's water content up; the effects of salt deficiency are just as serious as those of dehydration. In fact a normal water content of the body cannot be retained if there is a salt deficiency, nor can the proper salt content be retained in the face of dehydration. The kidneys adjust their excretions of salt and water to maintain both the volume and the salt concentration of the body fluids as nearly optimal as possible. Ideally, salt should be replaced at meal times in the food. In case of strenuous exercise in hot weather the sweat may contain more salt than usual and drinking 0.1% solution of salt in water to replace the sweat will be helpful. A total daily intake of 10 to 15 grams of salt (including that in the food) will be found adequate in hot weather. The athlete should avoid excessive amounts of salt. He should not take salt tablets because they may upset the stomach and he may not get the correct proportion of salt to water for maintaining optimal osmotic balance in the body fluids.

In hot weather it is a good practice for distance runners to weigh on accurate scales after each race in order to maintain water balance intelligently. If a runner becomes really overheated on a hot day (rectal temperature 105°F. or higher) he should restore his weight by drinking 0.1% salt solution, cool down in a cool shower or bath, and not attempt another race that day. In hot weather a man should not begin a 2 mile race if his deep body temperature is above 103°F. or a race of 3 miles or more if his temperature is above 102°F.

Our observations have shown that in clear, sunny weather with the air temperature 90°F. or above, it is not safe for men to run races of 3 miles or longer. Cases of heat stroke in men running 5,000 to 10,000 meter races in hot weather occurred in the Olympic Games at Paris in 1924, and in A.A.U. meets at Lincoln, Nebraska in 1931 and 1939. All of the cases at Lincoln made normal recoveries but they were in a dangerous situation. Our measurements on Don Lash, Tommy Deckard, and Greg Rice show that their rectal temperatures reached 106°F. in 3 to 6 mile races on sunny and humid summer days with the air temperature only 85°F. (figure 1). They

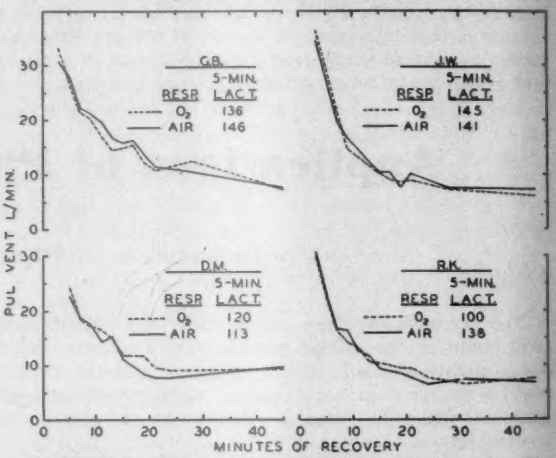

FIGURE 1. The rectal temperatures of champion distance runners following the warm-up (at 0 time) and at the ends of 3 mile and 5,000 m. runs (14 to 15 minutes) and of 10,000 m. runs (31 minutes). Air temperatures are shown at the end of each run. The highest rectal temperatures occurred on sunny humid days.

made normal recoveries from these body temperatures but they were on the verge of heat stroke. The body temperature normally rises to 103°F. during a 15 to 30-minute race even on a cool or cold day (figure 1). A deep body temperature of 103 to 103.5°F. appears to be optimal for running these races. From the above facts we are forced to conclude that races of 3 miles and over are definitely unsafe in hot weather and therefore should not be scheduled in hot climates and seasons.

The warm up before a distance race on a hot day should be reduced to a minimum to avoid a high temperature before starting. There is a physiological conflict between the demand for blood flow to the skin in heat dissipation and for flow to the working muscles to supply the oxygen necessary for energy transformation in the work. If a runner is too warm on a hot day before starting his race the blood flow to the skin will be increased;

(Continued on Page 13)

Form Analysis of O lym

By JESS MORTENSEN, *Head Tr h, Uni*

1 2 3 4 5 6

FUCHS

In Illustration 1, Jim Fuchs (Yale) shows a rather orthodox start, but in Illustration 2 we notice his right foot has turned so that his heel is pointing toward the toe board. In doing this, he is lifting up over his knee, with his back toward the toe board instead of his left side, this giving him a better chance to use his leg lift. Fuchs has thrown his left leg straight across the ring with an upward thrust to give him more speed. In Illustrations 3, 4, and 5, he has kept his body low over his der to giv Illustration 6, he appears ce just a given a tremendous pus leg and

HOOPER

Illustration 1 of Darrow Hooper (Texas A & M) shows that he does not get as low in his starting position as do either Fuchs or O'Brien. Also, it will be noticed that his right foot and right leg are in the more orthodox position near a right angle to his hips. In Illustrations 2, 3, and 4, Hooper has thrown his left leg out rather than up, and we note that it is thrown to his left, having a tendency to "step in the bucket." In Hooper's le left of the toe board ncy to tu open his stance. This ut down t

O'BRIEN

The sequences of Parry O'Brien (U.S.C.) shows his actual 57 foot put at Randalls Island. Illustration 1 shows Parry O'Brien just before his dip over his right leg, with his back toward the toe board and his right heel also pointing toward the toe board. O'Brien's position here is more pronounced than that of either Fuchs or Hooper. Illustration 2 shows a very low dip over his right leg that will give him a very long lift. This dip also is much lower than that of the other two men. Illustration 3 shows the high kick with the left leg, and we note that it is picked straight up and across the ring, with the knee pointing toward the ground. This high kick undoubtedly g speed ac keeps him low over his Illustratio O'Brien has planted both right sho final thrust off his right here that

In this analysis many of the features of the three shot putters are the same. However, in order to cover each step, the illustrations will be commented upon. The sequences are numbered from left to right.

At the top is the sequence of Jim Fuchs, since he is the world record holder and has started a new trend in shot putting form.

We can only summarize the form of these three great Olympic shot putters on this one particular put as shown in these sequences. It is evident that Fuchs replies on a lift over his shoulder with terrific speed in the ring, while the other two men use more of a shoulder whip from left to right. Fuchs has a very good finish off his lift leg that adds at least a foot to his distance. In other respects, all three put in a similar manner.

Both O'Brien and H ed Fuchs' trying to use a variat eir own p Hooper changed his f his year t Fuchs and O'Brien, a distance by over a foot.

It is interesting to ee men a

lympic Shot Putters

h, University of Southern California

ver his der to give a long lift. In 7 and 8, Fuchs lifts the shot well over his shoulder, following through from his right leg to his left. In Illustrations 9 and 10, we see one of the reasons Fuchs has thrown more than a foot farther than O'Brien and Hooper. He follows through and gets a last lift from his left leg which adds a great deal to the length of his drive and follow-through.

t." In Hooper's left foot is at the beginning of the shoulder drive that Hooper uses rather than the lift used by Fuchs is shown. In Illustrations 8 and 9, Hooper is transferring his drive from his right leg to his left leg, with a good wrist snap. Illustration 10 shows a good follow-through.

otedly gets speed across the ring and shoulders farther around to his right than does Fuchs. In Illustrations 4, 5, and 6, over his Illustrations 7 and 8, O'Brien has pushed off his right leg, and shifted to Illustration 9, O'Brien has left both feet with a fast thrust and ted both his right shoulder low for the his left, with a more circular motion of his shoulders than in a wrist snap. It would appear that he has not received full value out is right straight-over lift. Fuchs uses more of a straight-over lift. In of the drive from his left leg. Illustration 10 shows a good follow-through.

and Hooper Fuchs' form and are their size. Fuchs, at 210 pounds, has been timed in 9.8 for O'Brien, Hooper, and Fuchs in that order, are the three greatest a variation of their own particular builds. 100 yards. O'Brien has run 10.1, and Hooper plays end on the shot putters ever to compete in one season. Each man defeated ed his for this year to that used by Texas A & M football team. It becomes evident that speed is the other at least once during the season. Their individual Brien, and distance in three weeks very important, especially that of quick reaction time and a records are Fuchs 58' 10⅝" (world record); O'Brien 57' 5½" quick thrust. (Olympic champion); and Hooper 57' 1" (second in the Olympic esting to see three men are very fast for These three men, who finished one, two, and three, with Games).

(Reprinted courtesy of THE ATHLETIC JOURNAL, December, 1952)

(Continued from Page 8)

consequently, the flow through the muscles will be reduced and this will limit his energy output in the race. Increased flow to the muscles in hot weather reduces heat dissipation and increases heat production by the muscles and the runner gets hot.

2. Metabolic Recovery:

Rapid reduction of the oxygen debt and removal of accumulated lactic acid following a race is important in preparing for subsequent races. It is an established fact that the oxygen debt mechanism provides about half of the energy available to a miler for running his race and more than two-thirds of a half miler's available energy. The remaining energy put into the race is derived from oxidation of muscle glycogen during the race.

Figure 2 shows measurements of blood lactic acid in

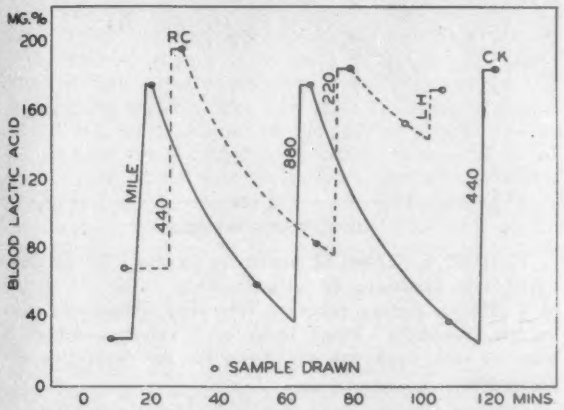

FIGURE 2. Blood lactic acid in Roy Cochran (RC) and Campbell Kane (CK) before races and during recovery between races in track meets. Kane ran the mile, half-mile and a quarter in the mile relay. Cochran ran the quarter, 220 yards and low hurdles.

Campbell Kane and Roy Cochran in recovery between races in meets held in 1941. The measurements on Kane were made in the Big 10 Meet that year where he ran the mile, the half-mile, and a quarter-mile in the relay and showed good recovery in about 40 minutes with excellent repeat performances. Those on Cochran were made in a dual meet earlier in the season in which he broad jumped, ran the 440, the 220, and the low hurdles. His recovery between races was not as complete as Kane's because of the jumping and the reduced time between events. This slowed up his performance, especially in the hurdle race.

a. Activity in Recovery:

The only known way to hasten the removal of a lactacid oxygen debt after a race is to alternate periods of light activity (walking and easy jogging) with periods of rest. This was first observed by Newman at the Harvard Fatigue Laboratory in 1937 and we have since confirmed it and studied its mechanism at Indiana University. Figure 3 shows recovery curves of Mel Trutt following exhausting runs on the treadmill. In some experiments he continued jogging slowly on the treadmill for 45 minutes after the hard run; in others he rested quietly on the bed during recovery. The disappearance of blood lactic acid was much faster when he jogged during recovery than when he reclined.

Data in figure 4 show that when Trutt continued jogging after a hard run his lactacid oxygen debt was only 55% as great as when he rested during recovery from a similar run. This probably means that the heart and active skeletal muscles were oxidizing more of the lactic acid as fuel during recovery when he continued jogging

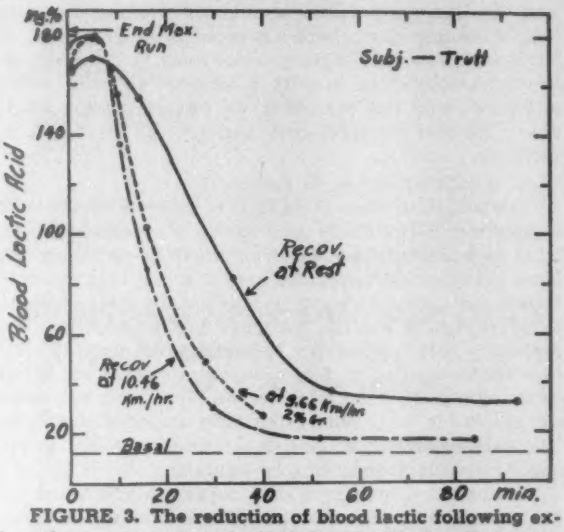

FIGURE 3. The reduction of blood lactic following exhausting runs on the treadmill by Mel Trutt. Reduction of lactate was much faster when he jogged slowly (10.46 km./hr. and 9.66 km./hr. or about 6 mph.) during recovery than in other experiments in which he rested quietly after the run.

than when he reclined. This accounts in part for the more rapid removal of lactate. Continued high blood flow during the active recovery helped to flush the lactic acid out of the tired muscles more quickly and thus hastened its removal by the liver and its metabolism by the heart muscle.

It should be emphasized that each runner should study his own recovery and determine for himself the amount and rate of activity to use. It would probably be inadvisable for men to jog continuously for 45 minutes at 6 mph as Trutt did in these experiments even in cool or cold weather. Each man should begin his experimentation by alternating periods of walking, jogging, and resting and try varying amounts of each until he finds out which is best for him.

The temperature of the environment must be considered in the use of activity to hasten metabolic recovery. As stated above work, even walking or jogging, tends to

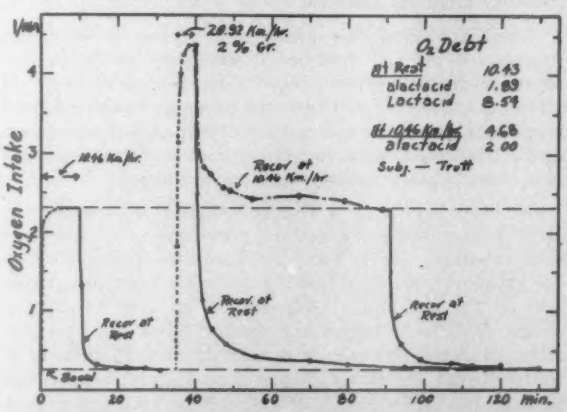

FIGURE 4. The oxygen debt following exhausting runs on the treadmill (20.92 km./hr. or 13 mph. up 2% grade). The lactacid oxygen debt was 8.54 liters in the experiment in which the subject (Trutt) rested during recovery and only 4.68 liters where he jogged at 10.46 km./hr. during the first 45 minutes of recovery.

keep the body temperature up. In hot weather the problem of cooling down between races is as important as lactic acid removal. A compromise must be reached and, as stated above, the activity is reduced to brief walks alternated with rest periods in the coolest location available. In cool weather more activity can be taken in recovery.

b. Breathing oxygen in recovery:

The administration of oxygen to athletes in attempts to improve performance and hasten recovery has been tried by numerous coaches and trainers in various sports since the Japanese swimmers used it in the 1932 Olympic Games. A swimmer gains an advantage from it if he breathes rapidly and fills his lungs with pure oxygen immediately before he starts. If he delays a couple of minutes before starting he blows the extra oxygen out of his lungs and there is no gain, for he must have the extra oxygen in his lungs during the early stages of the swim. The help the swimmer gets in this case is related to the special breathing problems in swimming.

Giving a few breaths of pure oxygen to athletes at the beginning of rest periods in an attempt to hasten recovery and improve performance in subsequent competition is a common practice. As a result many inquiries are made of physiologists and physicians regarding the efficacy of the practice and the effect of oxygen when used in this way. On the basis of fundamental knowledge of the mechanisms involved in oxygen transport and usage by the body, the physiologist would predict that oxygen breathed in this way would not benefit the athlete physiologically in bringing about a quicker recovery.

Under ordinary conditions of health, oxygen usage by the human body is determined by the need of the tissues for oxygen and not by increasing the oxygen supply to the lungs above normal. The respiratory properties of the blood are such that, at ordinary altitudes, raising the percentage of oxygen in the lungs above the normal does not significantly increase the amount of oxygen carried by the blood from the lungs to the tissues. At high altitudes there is a deficiency of oxygen and therefore breathing pure oxygen will increase its pressure in the lungs and the blood will be able to combine with its normal amount of oxygen. There is no deficiency of oxygen in the lungs of men breathing air at low altitudes during rest periods following athletic contests and therefore we would not expect breathing pure oxygen to hasten their metabolic recovery from the exercise.

Since we have this knowledge of the fundamental processes I did not consider it necessary to do experiments to determine the effects of oxygen on recovery in athletics. However, I have had so many inquiries from coaches, physicians, and athletes that about two years ago I conducted some experiments in order to gain information bearing directly upon the problem.

In experiments on 4 trained athletes we studied the effect of continuously breathing pure oxygen as compared with breathing air in other experiments, during 60-minute recovery periods following 5-minute runs to exhaustion on the treadmill. Observations on lung ventilation (respiration) were begun immediately after the runs and followed minute by minute during the first 30 minutes of recovery and thereafter during 5 to 10 minute intervals through the remainder of the 60-minute recovery period. Blood samples for lactic acid analysis were drawn at approximately 1, 5, 14, 28, 42 and 60 minutes of recovery. These measurements indicate the rate of recovery from a lactacid oxygen debt incurred in exhausting work. Blood lactic acid increases greatly in exhausting work and at the finish indicates the degree of exhaustion.

We found that physiological recovery was at about the same rate whether the men breathed air or pure oxygen continuously for 60 minutes after the runs. The rate of lactic acid removal in recovery was unaffected by breathing oxygen (table 1). The average rate of recovery of lung ventilation was also the same with oxygen as with air (table 1 and figure 5). These physiological measure-

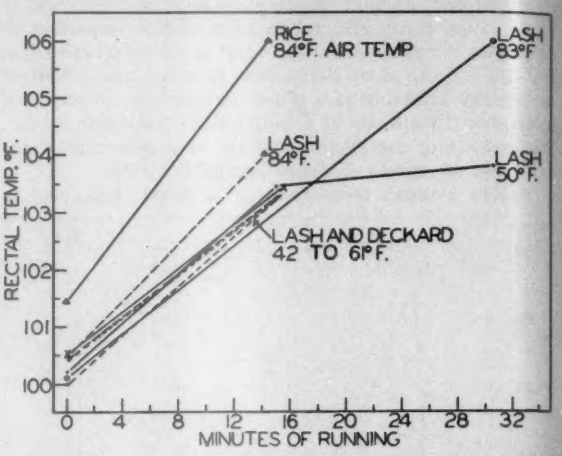

FIGURE 5. Effect of breathing oxygen (O_2) as compared with breathing air on pulmonary (lung) ventilation of 4 athletes during recovery following exhausting runs on the treadmill. Blood lactic acid values observed 5 minutes after each run are given for the respective experiments.

ments give no evidence that continuous breathing of oxygen hastens recovery of healthy men from strenuous exercise at ordinary altitudes where there is no oxygen deficiency in the atmosphere. If continuous breathing of oxygen for 60 minutes after exercise does not improve physiological recovery, a few breaths of oxygen, as the trainers administer it to athletes, would surely not affect it either.

Table 1. The effect of breathing oxygen as compared with breathing air on recovery of men following exhausting runs on the treadmill. The values tabulated are the average rate of blood lactic acid removal from 5 to 28 minutes of recovery (higher rates indicate more rapid recovery), and the average lung ventilation from 3 to 45 minutes of recovery (lower average ventilation indicates more rapid recovery).

Subj.	Lactic acid % reduction/min.		Lung vent. liters/min.	
	Air	O_2	Air	O_2
G.B.	2.09	2.12	17.9	17.7
R.K.	3.70	2.98	13.1	13.1
D.M.	2.40	3.00	13.3	14.3
J.W.	2.67	2.40	13.6	13.3
AV.	2.72	2.63	14.5	14.6

My personal opinion is that, in spite of the fact that there is, physiologically, neither benefit nor harm derived from administering oxygen to athletes for short periods, the practice should be discouraged for psychological reasons. School athletes should be taught confidence and self-reliance; their dependence on outside aids—oxygen, massage, liniments, etc.—can develop hypochondriac tendencies. The coach should be able to inspire determination and confidence in his athletes without resorting to devices which may damage them psychologically.

Shot Put

By COL. FRANK ANDERSON

Track Coach, Texas A & M College

The shot put has seen very little new in the last thirty years in regard to pure theory. Thirty years ago I heard a great shot put coach, Henry Shulte of Nebraska, say that we should use the big muscles first in giving momentum to the shot. The latest development as used by O'Brien and followed by Hooper, and now many others, is simply putting into practice in a more efficient manner the use of the big muscles of the body in the first stages of the shot put delivery. The back and leg muscles are very powerful and can deliver still more if the skeleton is properly aligned in the delivery effort. The left side forward body swing did not fully use the strong back muscles. The new style of a low bend with face, chest, knee and toe all facing to the rear lines up the skeleton for a proper start with maximum potential. The powerful back and leg muscles can now deliver a maximum amount of effort in starting the travel from low to high and from rear to front. The bend to the rear should be as low as the individual can recover from with a minimum loss of speed. The glide across the circle is low, with the right foot very close to the ground. There must be NO sinking of the body in landing from the travel glide. The body drop is made before the glide begins. The muscles are brought to the proper flex before the travel is completed. O'Brien stands higher in the rear of the circle before the travel starts than does Hooper, our demonstrator today, and drops his body to the rear to a lower point than used by Hooper, who uses more of a crouch to begin with. O'Brien's method is to be preferred probably, as it gives him the benefit of a back swing just before the delivery. A back swing is to be desired in all athletic events where the effort ends in a throw. In a back swing the face should lead to the rear, as it does to the front just before the delivery effort begins. I have never been able to understand why our javelin throwers do not look to the rear as the back swing of the body and arm begins. I still think they should. In the shot as in the javelin, the eyes should be on the shot as it leaves the hand. The shot should leave the hand at the highest, most forward position possible to carry it, consistent with a fair throw. O'Brien seems to put from an on the diameter position. The chest is high and the delivery is straight from the shoulder. Hooper uses a slightly open stance. I think the open stance would be better, as it allows the body to face the front in the final delivery more easily. I would suggest having the toe of the left foot land some ten inches to the left of the diameter at the toe board.

Our best modern shot putters undoubtedly use every muscle from the toe to the finger tips in a better manner than their predecessors of a few years back, but much of the improvement has resulted from harder work. O'Brien has probably put the shot twice as much as most shot put champions, maybe more than that. Our boys at Texas A & M work much harder than our boys did a few years back. We had three out of four to place in the Kansas Relays. The three boys worked out a lot together, I would say at least 50 puts per day. The three boys averaged 10 feet in their improvement in the 16 pound shot over their first efforts in college. Hooper has been a great impetus in shot putting at our school. Once before, in 1934, I was asked to lead a shot put discussion at our annual clinic. Honk Irvin was the reason then. I have Hooper to thank for this honor today. He is a great athlete and a great boy.

Workout Schedule for 1953
Darrow Hooper
Texas A & M College

I. Warmup for all workouts:
1. Jog ¼ mile with good stride to stretch legs.
2. Exercise with feet spread apart and lower folded arms to ground.
3. Situps to warm up back muscles.
4. Fifteen pushups on fingertips.
5. Loosen wrist by flipping shot with arm only.

II. Workout:
1. Put shot from front of circle without reverse concentrating on getting proper weight shift across the legs, proper elevation of the shot, and follow through. Start this exercise at 75 per cent effort and finish with 100 per cent.
2. Put shot from front of circle as in 1. with reverse at 100 per cent effort.
3. Put shot across circle with travel very slow, concentrating on assuming proper putting position and using proper technique at the front of circle at 100 per cent effort.
4. Put across circle with as much speed as possible (similar to sprint starting) to improve reaction timing and to attain a high controlled speed travel at 80 per cent effort.
5. All the preliminary breakdown work is completed and the shot putter is now ready to begin the full operation. Put with 100 per cent effort a number of puts analyzing each put for position at front of ring, weight transfer across legs, elevation of shot, wrist flip, and follow through over the toeboard.
6. About five puts across circle correcting major flaws in above puts at 75 per cent effort.
7. Repeat hard 100 per cent effort puts as in 5.

The above workout schedule can be followed the entire season with early season work concentrating on the individual component exercises and the late season workouts, when the form is pretty well refined, concentrating on the actual putting and increasing speed of travel across the circle. The total number of puts in each workout would be about 60 puts, with the puts in each exercise varying according to physical condition.

After Monday and Tuesday workouts all season take short dashes varying from 15-50 yards to increase speed of travel across the circle.

Parry O'Brien
Training Schedule

In answer to your request concerning my training schedule, I have listed the following: In winter time I lift weights under the direction of a regular weight lifting instructor to build strength and keep in general con-

ditioning. When spring comes I follow the schedule below:

March to June

Monday:

1. General warmup exercise and calesthenics.
2. Run (sprints of 30-40 yards).
3. Standing throws starting at low distance, increasing to capacity.
4. Circle work without shot. (Gliding across ring emphasizing foot position and lowness.)
5. Throws to lower distance, stressing form and coordination 20-30 throws.
6. Work out problems experienced during Saturday's meet. On Monday never throw as hard as you can.

Tuesday:

Basically the same as Monday, but I go up to the dance studio before I go out to the field and practice glide in front of mirrors to stress position so I can see it. I also throw 10-12 times hard, to see if my form is okay and my strength is up—hitting consistently 55'-56'.

Wednesday:

Again basically the same as Monday, except with more time spent without the shot, circle glide, reverse, are all included on Wednesday. No throws of over 54', only easy.

Thursday:

Again basically the same as Monday with plenty of wind sprints and general exercise, not too much work this day with the shot. However, I throw 5 or so times for distance on Thursday, 55'-56'.

Friday:

Most shot putters, if putting on Saturday, lay off on Friday. I did up until the '53 season, then I hit it 7 times a week. I don't recommend anything special for Friday workouts; it depends on how I feel. I'm strong physically and can take 7 days' workout where perhaps others find it taxing on Saturday's meet energy.

Saturday:

1. General warmup, not too strenuous as to expend any of the valuable energy you've worked up during the week.
2. Standing throws at capacity, throw hard 5-8 times stressing hip, arm, leg and back coordination. Mine go 52'-54' on a hot night.
3. I throw No. 1 and No. 2 in competition ¾ strength to get the feel of the circle, surroundings and judges, then on the 3rd one I try for my distance.

Sunday:

I work out any problems on Saturday's meet that I may have. Easy running, a few easy throws, then go in—1½ hours.

My physical training habits are as follows:

1. Rest 8-12 hours.
2. Proteins and little carbohydrates.
3. Mental work up of meet day, regardless of size of meet.
4. I work out alone mostly to permit myself to concentrate.
5. I take honey for quick energy. Whether I derive any from it I don't know, but the illusion is good.

High Hurdles

By JESS MORTENSEN

Track Coach, University of Southern California

In presenting this paper on high hurdling the writer will not attempt to go into a detailed discussion on the technique employed by the leading hurdlers, but will discuss the form used by Jack Davis and Willard Wright, the present hurdlers at the University of Southern California. There are some fine books that give detailed information about many of the leading hurdlers for the past thirty years. Coach Ken Doherty of the University of Pennsylvania has a new book just out that gives a fine discussion on the forms employed by many of the leading hurdlers since 1898.

It is safe to say the best form in hurdling is to stay as near to sprinting action as is possible at all times. Because we have found that the boys who can cover the distance faster are the ones who are running the fastest times in the high hurdles. Dillard proved beyond doubt that to be great in the high hurdles it is not necessary to be over 6-feet tall. However, we will also have to say that if you can sprint the 100 in 9.5, as Dillard has done, that certainly the high hurdle record will drop below 13.5. Continuous leg action from take off to landing and certainly a snap down over the hurdle are very important and will cut down the time the hurdler is in the air.

Such points as body angle at the take off, forward lean over the hurdle, lead leg relaxation and snap down, trail leg delay and quick pull through, opposite arm thrust are all important in maintaining balance and relaxation and conserving time over the hurdle.

There has been much discussion regarding which is the better, the two arm thrust or the opposite arm thrust. I feel that it is up to the individual hurdler and is important only as it helps maintain balance and becomes a part of his continuous motion and sprinting action. It would seem to me that the two arm thrust is not a natural sprinting action.

In discussing the hurdling form of Jack Davis, my remarks may be prefaced by saying Jack is 6'3" tall and weighs 185 lbs. He has run 100 yards in 9.8 seconds and the 220 in 21 flat. He might be called a power runner and hurdler. Jack is not especially loose in the hips and therefore is forced to turn slightly as he goes over the hurdle and the lead arm is forced out as it comes back to help maintain balance. Jack uses an accentuated forward lean over the hurdle and snaps the lead leg down which will in itself pull the trail leg through. I believe some coaches put too much stress on the action of the trail leg. We believe that if the trail leg drives at the top of the hurdle and is flat over the hurdle it will take care of itself if the lead leg is used properly.

As you have noticed he is not particularly fast for the first five hurdles but builds up great momentum from there on. This is probably due in part to his size and reaction time out of the blocks. We have put in a great deal of time the past season on his start and work over the first three hurdles.

Jack uses an orthodox sprinter's start with most of his weight on the front foot and hands. He starts with his right foot forward which is his take off foot. We noticed

in his sophomore year that he was having trouble getting too close to the first hurdle which not only threw him off on the next three or four hurdles but straightened him up badly and threw his entire balance off so that he was practically stopping over each hurdle. To assure proper distance at take off he cut down his first two steps out of the block which also improved his start.

Jack uses eight strides to the first hurdle, his take off is 7'6" from the hurdle, he lands 4' from the hurdle, his first stride is 5'1", and his second 6'11", his third 6'6" and then takes off 7'6" from the second hurdle. It is very important to put in a great deal of time on the start and step to the first hurdle because it is very difficult to change the stride between hurdles. Further, the high hurdler must straighten up a little sooner than would the sprinter to be in position to take the hurdle.

The lead leg comes up with the knee slightly flexed to prevent locking. As the foot clears the hurdle it is thrust down to prevent floating. He actually shoots the foot at a spot just beyond the hurdle when he takes off to prevent the locked knee.

The trail leg is delayed slightly to maintain proper rhythm. The knee comes up as in a regular stride and flattens out as it reaches the top of the hurdle. It should be pulled through with a quick snap at this time to get into sprinting form again.

The opposite arm should be thrust forward just as it would be in a regular stride and pulled back close to the body. However, Jack's arm is pulled out to maintain balance as I stated previously. The trail arm is used the same over the hurdle as in regular sprinting form. The arm action between the hurdles is very vigorous, probably more than would be used by the sprinter. There is some difference of opinion regarding the body angle over the hurdle. Jack uses a pronounced forward lean with the upper body and head which helps to accentuate the downward thrust of the lead leg. It is important to time this forward lean so that it is not started too soon. If the body is thrown forward at the time of take off it will tend to put the weight back on the heel of the take off foot. It is important to stay well up on the ball of the foot at all times to maintain forward momentum and clearance of the hurdles.

Many races are won over the last hurdle to the tape. Jack has been very successful in maintaining balance and coming off the last hurdle with a good forward lean to insure a driving finish to the tape.

Early season work outs will include stretching exercises to loosen the leg muscles and hips. These of course should be kept up throughout the season. No hurdles should be used until the men are in condition to sprint loosely. Jack begins by using one hurdle then moves on to three. He does very little "five step" hurdling. We feel that to insure proper timing the men should run over the hurdles at top speed most of the time.

A few of the common faults in hurdling form may be listed as follows:

1. Improper step to the first hurdle.
2. Take off too close to hurdle.
3. Locked lead leg.
4. Trail leg too fast.
5. Trail leg not flat.
6. Improper use of lead arm.
7. Take off land flat footed.
8. Floating (not snapping down lead leg).
9. Galloping between hurdles.
10. Not maintaining forward momentum.
11. Failure to concentrate on hurdles during race.
12. Lack of work over full flight of hurdles. Nothing will take the place of hard work over the hurdles.

How We Train Our Cross Country Men at Miami

By GEORGE L. RIDER

Track Coach, Miami University

At the request of Bill Easton, your track editor and my good friend, I agreed in one of my weaker moments to tell how we proceed in training our cross country men at Miami. I am sure we have no magic formula for developing distance runners that is unfamiliar to any experienced coach, but perhaps a brief statement of our training program may be of help or interest to our less experienced coaches and to the boys who are looking forward to track or cross country running in high school and college.

Cross Country or distance running (two miles for high school boys and three to four miles for college men) is one of the most challenging and satisfying activities in our broad sports program. Running is perhaps the oldest natural activity and also the most democratic of our sports today. It is an activity in which any boy who is physically and organically sound may participate if he desires to do so. It requires less expense for equipment than any other sport unless it is swimming. Furthermore, if it is properly supervised, it is one of the greatest developers of organic strength and vigor so essential to well being. And may I add for the benefit of doubting Mothers and Fathers, that properly supervised distance running is not in the least dangerous for your boys, but on the contrary, one of the most wholesome of activities. The records now show that our longest lived athletes are those who have carefully trained for distance running and other activities requiring long sustained effort.

Now may I briefly explain our training procedure at Miami. First, all candidates for our cross country team are required to have a very careful physical and medical examination and only those passed by the doctor are permitted to participate. When the boy presents a slip from the doctor okeying him for cross country, he is issued equipment and becomes a member of our squad. Before we begin serious work we try to learn as much as we can about each boy's background. We like to know something about his home life, his play life and the running experience he has had before coming to Miami. We have many boys reporting for cross country with no high school running experience, others with some mile and two mile experience. We start working our boys on what we consider a sound basis for acquiring a foundation of health which involves strength, vitality, and endurance. Such development will enable a boy to go through competition on his natural vitality and be able to recuperate quickly from his effort. Our experience convinces us that each boy presents an entirely individual problem and must be studied and trained accordingly. We begin our work in easy stages and do most of it on the good turf of our golf

course. It consists of alternate running and walking with a fair amount of developmental exercises principally of the bending, stretching and loosening type. This kind of work continues for the first ten days or two weeks with a gradual increase in the speed and distance of the runs as the boys get over the first muscle soreness. Early in August we send a letter to all our prospective cross country candidates asking them to begin this easy practice every other day so that when they return to school in early September they will be ready for hard work.

We have tried over the years to find some short cut to successful distance running, but up until now, have found no formula. The only way to success is through hard work over a long period of time, with a keen individual desire for self-improvement and a willingness on the part of the boy to make some self-sacrifice. Only in this way can one gain the knowledge of racing form and tactics, the condition or the vitality and endurance necessary for championship performance. It is necessary to teach boys to run up grade or uphill, to run on the flat and also to run down grade. We try to make our boys realize that a hill is a challenge to him just like it was a tough opponent. He must pay attention to his form in running up hill and when he reaches the top he must not slow down. When he comes to the flat he must change his form and run at a good pace. Down hill running presents another problem and he must learn to negotiate the down grade in proper form and at good speed. This uphill, down hill and flat running requires the boy to think. If he can remain alert and think of what he is doing and be ready to challenge or accept the challenge of the opposition, even though he may have less physical ability than his opponent, he will be able to make use of everything he has and as a result will do his best running when he gets into competition. This serves to illustrate that it is an individual problem for each boy as we go about training him and helping him to improve.

It has been proved rather conclusively that the least fatiguing way to run a distance race is to run it at even pace. We therefore do a lot of work running our boys at different distances on the watch at different speeds so that they will know their best pace when they get in a race and not be confused or frightened by an opponent who may be running far off the pace. If you are running four miles it is not difficult to run the first mile on even pace but it is very easy to get off pace on the second or third mile. It is necessary therefore in practice to check time for the boys at different stations to see that they keep to the pace desired. Many coaches overlook this ability of boys to hold pace. The boy's mind must be kept alert to pace in the race because it can come to his rescue when he begins to tire. If he can analyze himself a little, think about the watch when his legs or arms begin to tire he may be able to overcome that trouble and hold pace. It is comparatively easy to follow a competitor who sets the pace and run along quite fully relaxed physically and mentally. But the boy who can go out and run on the watch with an alert mind is the one we expect to make records.

Distance running can become rather monotonous, especially if run on the track. We therefore like to have several cross country courses on which we may run at different times. We have our boys do most of their running on grass rather than on the roads or the track. About the only time we use the track is when we are doing speed work or occasionally for pace work. To make it more interesting we divide our men into groups according to their ability and have an occasional relay race. By placing an inexperienced man in relays with experienced good men, we are frequently surprised to find them doing better than they had ever done before. This type of practice will do much to stimulate boys who otherwise might be nothing but followers.

When we are working on pace we like to change the leadership among the boys so that they may all get the experience of leading or setting the pace. This will help to keep them from becoming satisfied to be a follower or to be defeated day after day by the best boy in the group. Again, by handicapping we occasionally get our best boys defeated which proves to be helpful to both the victor and the vanquished. Again I would like to emphasize that distance running is so individualistic that it is necessary to work out schedules to fit each man on the squad if you are going to get the best performance out of him.

It must be remembered that schedules of work will change as the season advances and you get into the racing schedule. Perhaps the hardest work will come in early season when the boys are getting in condition and we usually ease off a bit as the season advances and the boys reach top condition. We always figure the hardest job in our coaching is not that of getting the boys in good condition, but keeping them there once they have reached peak performance. We are always reluctant to give anyone a definite schedule of work for each day of the week, because of the many factors involved. The weather and running conditions, the time of the season and the individual differences of the boys make it impossible to prescribe a schedule that will fit the needs of all members of the squad. I am therefore going to suggest a schedule for a mid season week's work with the admonition that it is only a suggestion which will necessarily have to be modified to fit the individual differences and needs of your men. In general our work is divided into over distance work for endurance, under distance work for speed and pace with an occasional even distance for the purpose of learning just how to run the full race. I must add that at present we emphasize under distance and speed work considerably more than we do over distance and we are satisfied that the results justify this method of training.

MONDAY

Usually this is over-distance day. Every day we start out with a warm up which includes easy jogging for about ten minutes with a few bending, stretching and loosening exercises. When thoroughly warmed up we may run from four to six miles. This is taken at varying pace, some of it fast, and some slow, with emphasis on proper form and relaxation. We have pace setters for different groups and want them to go the whole distance without stopping because we believe it essential to work on sustained effort such as is required in actual racing. After the boys have finished their over distance work and have spent a few minutes walking, we take them to the track for a little pace work running against the watch, or we may finish with a short sprint of a hundred and twenty or two hundred yards on the grass. We feel that it is good to combine speed work with over-distance running.

TUESDAY

Usually devoted to speed work. This work is varied to suit the apparent needs of the boys. It may consist of seventy second quarters or 2:10 to 2:30 half miles and occasionally matched relays of similar distances. We may run from two to five 440s with a short rest between each 440 or it may be two or three 880s with a short rest

between. We plan to finish the day's work with a 440 the first 300 fairly easy finishing with a strong sprint. We feel that the amount of work each day must be regulated to fit the individual needs of each boy and we try not to have them exhausted after any day's work. We want them to finish the day feeling they would like to do a little more so they will be anxious for the next day's work.

WEDNESDAY

Usually either race or pace day. We prefer to do all Wednesday work on our regular course. If we race, it is usually half to three quarters the distance we expect to run in the race the following Saturday. If we run two or three miles in this workout we keep time on their 880s or each mile, trying to hold them to a pre-arranged pace for each 880 or mile. We sometimes run two or three measured 880s or a couple single miles on our regular course again trying to meet required pace. We feel that pace work should be done on the regular course because of the great difference from running on the cinder track. We usually end each day's work with an easy 440 or 880 around the field.

THURSDAY

Usually a speed day with some easing off on the amount of work. We have short races 100 to 300 yards on the field between picked men or we may run short relays. We occasionally practice our start, running 200 to 300 yards to the first turn on our course. We believe it best to make Thursday a lighter day than the three previous days so that our boys may begin to store up a bit of surplus energy for the race on Saturday.

FRIDAY

Is a day of rest. If we are on the road there will be no running. If at home we may simply walk over the course with the boys, working out any strategy we may have in mind or we may have them jog around a little and take a few light exercises to limber up. In the event they take the easy warm up, we have them finish with a short warm bath.

SATURDAY

It is very important to eat your pre-race meal at least three and we prefer four hours before the race. This meal is light and consists of something we know agrees with the runners that is easily digested. We want our boys dressed at least forty-five minutes before race time in order that they may have ample time for a thorough warm up, and a few minutes rest before the start of the race. We always take a few wind sprints in our warm up for the race along with one to two miles of easy running. We find some boys need more warm up than others, but we always prefer to err on the side of too much warm up rather than not enough. It is our opinion that most inexperienced runners will not warm up enough either for practice or for a race unless the coach directs them.

In conclusion we believe distance running requires better condition and therefore more careful training than any other form of athletics. Regular meals, regular hours of sleep and rest and work are imperative. No good athlete will do anything to dissipate his strength and that implies among other things, total abstinence from tobacco or alcoholic beverage.

This sample form letter can be used by all NCTCA District Membership Representatives in membership promotion. Get your letter out at once for 1954 membership to all track coaches in your district.

TO: All Track Coaches in NCAA 3rd District

FROM: Percy Beard, Track Coach
University of Florida, Gainesville

The purpose of this memo is two-fold:

1. As your representative on the NCAA Track and Field Rules Committee, I invite you to send me any suggested rules revisions so that I can present them at the annual meeting of the Rules Committee in Lincoln, Nebraska on June 17, 18.

2. As your representative on the Advisory Committee of the National Collegiate Track Coaches Association, I want to call to your attention that the annual meeting will be held in Lincoln starting Wednesday night, June 17. The 1953 clinic includes the following:

Broad Jump—Ward Haylett
Applications of Physiology in Athletics—Dr. Sid Robinson
Shot Put—Frank Anderson & Darrow Hooper
High Hurdles—Jess Mortensen & Jack Davis

If you cannot attend I urge you to send a check for your annual dues ($5.00) to M. E. Easton, Track Coach, University of Kansas, Lawrence, Kansas. This entitles you to a copy of the clinic notes and also a year's subscription to "Track and Field News." It is money well spent. High School Coaches may join as allied members for $3.00 and receive the same items.

Special Notice:

Past Clinical Notes are available to coaches who have just joined the NCTCA or others, at $1.50 per copy. Make check payable to NCTCA and mail to M. E. Easton, Sec'y., University of Kansas, Lawrence, Kansas.

Extra sequence pictures of javelin, (Held) shot, (Fonville, Fuchs, 1953 full page) and discus, (Gordien, Fitch) are also available at 50c each.

1953 All-America Collegiate Track and Field Team

Following the 1953 National Collegiate Championships at Lincoln, the NCAA Track and Field Rules Committee met and selected the following All-America College Track and Field Team for 1953. These All-America team members are presented with certificates annually by the National Collegiate Track Coaches' Association. The selections for each event are listed alphabetically.

All-American certificates awarded annually by the NCTCA have been made and mailed to each of these men. Duplicates may be purchased by the institution for $4.00. Mail check to M. E. Easton, Secretary NCTCA, University of Kansas, Lawrence, Kansas.

Pole Vault: Fred Barnes of Fresno State College, David Kenly of Arizona State College, Jerry Welbourn of Ohio State University.

High Jump: J. Louis Hall of University of Florida, Milton Mead of University of Michigan, Mark Smith of Wayne University.

Shot Put: Darrow Hooper of Texas A & M College, Thomas Jones of Miami University (Ohio), Parry O'Brien of University of Southern California.

Javelin Throw: Richard Genther of University of Southern California, Robert Kimball of Stanford University, Ray Rocker of Loyola University of the South (La.)

Broad Jump: John Bennett of Marquette University, Bobby Ragsdale of Texas A & M College, F. Morgan Taylor of Princeton University.

Mile Run: Fred Dwyer of Villanova College, Joseph La Pierre of Georgetown University, Wes Santee of University of Kansas.

440 Yard Dash: James Lea of University of Southern California, Don Smith of University of Kansas, Verle Sorgen of University of Southern California.

Discus Throw: John Ellis of Lafayette College, Sim Iness of University of Southern California, Parry O'Brien of University of Southern California.

100 Yard Dash: Thane Baker of Kansas State College, Leslie Laing of Fresno State College, Willie Williams of University of Illinois.

120 Yard High Hurdles: Jack Davis of University of Southern California, Joel McNulty of University of Illinois, Willis Thomson of University of Illinois.

880 Yard Run: Paul Carlin of University of Wyoming, Paul Raudenbush of University of Pennsylvania, Lang Stanley of San Jose State College.

220 Yard Dash: Thane Baker of Kansas State College, Leslie Laing of Fresno State College, Rod Richard of University of California at Los Angeles.

Two Mile Run: Charles Capozzoli of Georgetown University, Rich Ferguson of University of Iowa, Gene Matthews of Purdue University.

220 Yard Low Hurdles: Jack Davis of University of Southern California, Joel McNulty of University of Illinois, John Mapp of Virginia Military Institute.